BOOKLET OF
INFORMATION

U. S. S. LOS ANGELES

And

NAVAL AIR STATION

LAKEHURST, N. J.

By

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LAKEHURST, N. J.

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INTRODUCTION

The subject of rigid airships appeals to us today as a new industry, a new art; it appeals to us as an exponent of our National honor and prowess; it appeals to our patriotism, and thus all of us are interested.

The purpose of this publication is to convey to the laymind a brief non-technical description of America's great airship, a word about its construction, working principles, method of handling and operation, and an insight into the commercial possibilities of airships in the future service of mankind.

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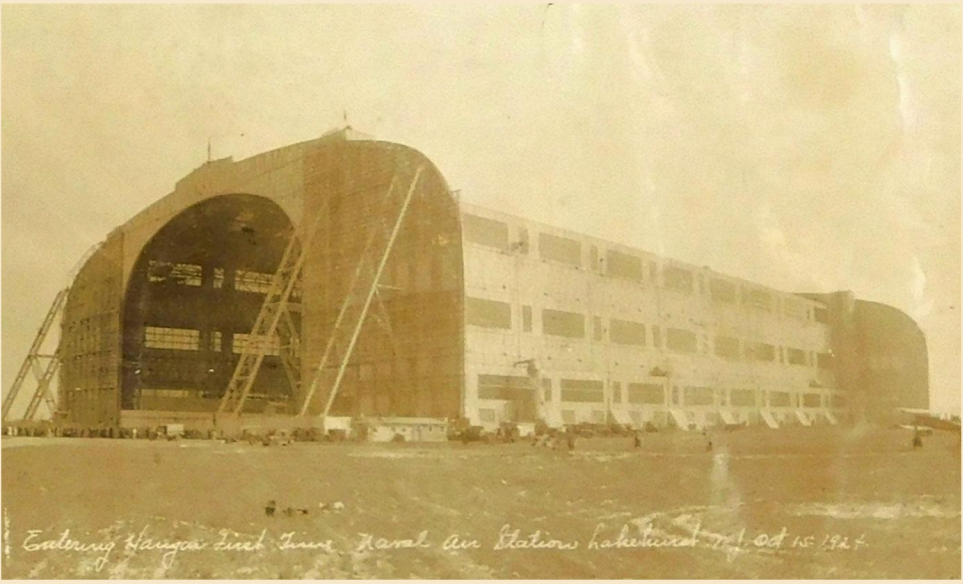
U.S.S. Los Angeles

On October 12, 1924, LZ-126 departed Friedrichshafen for its transatlantic delivery flight to the United States, with Dr. Hugo Eckener at the helm and U.S. Navy representative Captain George W. Steele aboard; the journey required overflight permissions from Allied nations including France, Spain, and the Azores bases. Covering approximately 5,000 miles (8,150 kilometers) in 81 hours, the airship navigated thick fog at departure, strong headwinds, and Atlantic storms, arriving safely at Naval Air Station Lakehurst, New Jersey, on October 15, 1924. This pioneering east-to-west crossing demonstrated the viability of rigid airships for oceanic travel and marked the first delivery of a Zeppelin to a foreign power.

The airship was formally accepted by the U.S. Navy and flown to Naval Air Station Anacostia, Washington, D.C., for its commissioning ceremony on November 25, 1924, where it was christened USS Los Angeles (ZR-3) by First Lady Grace Coolidge, with Captain Steele assuming command.



The USS Los Angeles (ZR-3), originally designated LZ-126 by its German builders, features a rigid aluminum alloy framework typical of Zeppelin designs, consisting of approximately 30 transverse ring frames spaced about 20 feet apart along its 658-foot (200.7 m) length. These polygonal frames are interconnected by 18 longitudinal girders that form the primary skeletal structure, providing rigidity and support for the overall hull. Internal wire bracing, including diagonal cross-wires and inter-ring supports, enhance structural integrity against aerodynamic stresses and weight distribution, while a central axial keel runs the length of the ship to house crew quarters, fuel tanks, and access walkways.

The outer envelope is constructed from doped cotton fabric treated with varnish and silver paint for weatherproofing and tautness, encasing the internal lifting gas system without contributing to lift itself.

The gas cells are arranged between the transverse frames and secured by netting to prevent shifting; four ballonets, air-filled compartments at the nose and tail, allow dynamic pressure control by adjusting volume during altitude changes to maintain the envelope shape. The airship has a diameter of 90 feet 8 inches (27.6 m) and a useful lift of 66,970 pounds (30,360 kg).

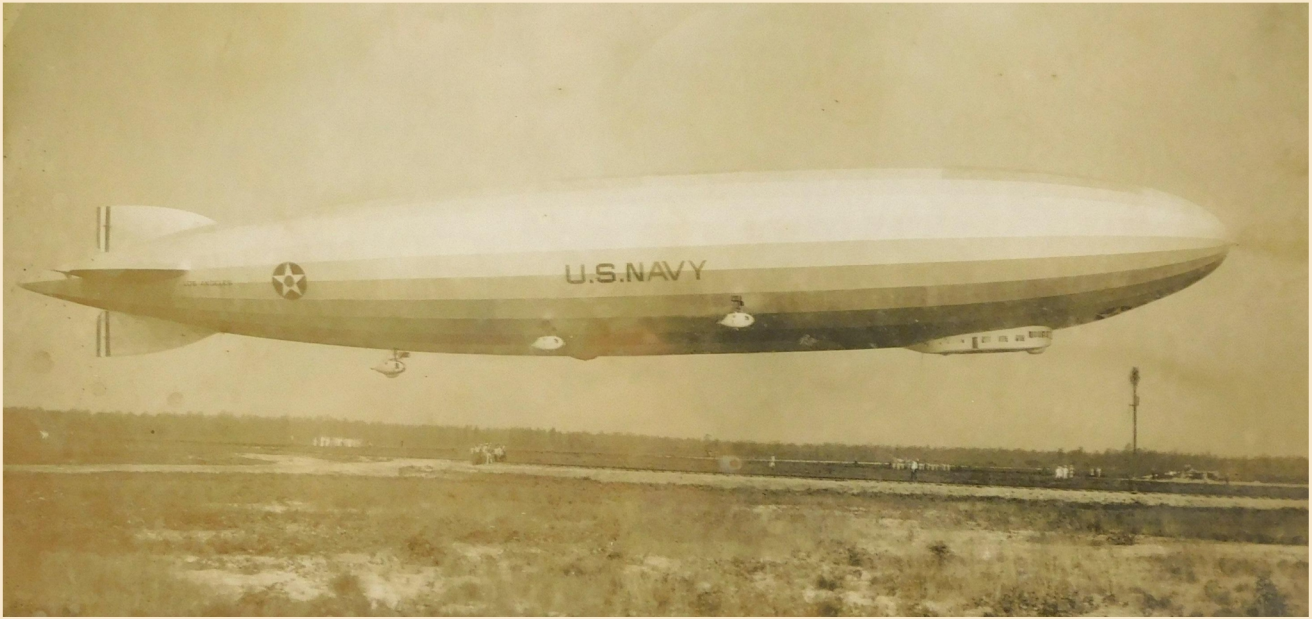
At the stern, the framework transitions to an octagonal cross-section to support the tail assembly, comprising four octagonal fins arranged in a cruciform configuration for stability. These fins bear fixed surfaces augmented by movable rudders for yaw control and elevators for pitch, all connected via external steel rigging cables to the main hull for tension and adjustment during flight. This rigging also facilitates mooring and handling on the ground.

Crew accommodations are integrated into the central keel to optimize space and weight distribution for extended operations, including 20-30 berths for personnel, a compact galley for meal preparation, and observation gondolas or windows for navigation and scouting. This layout supports missions lasting days, with provisions for rest and basic sustenance amid the airship's limited internal volume.

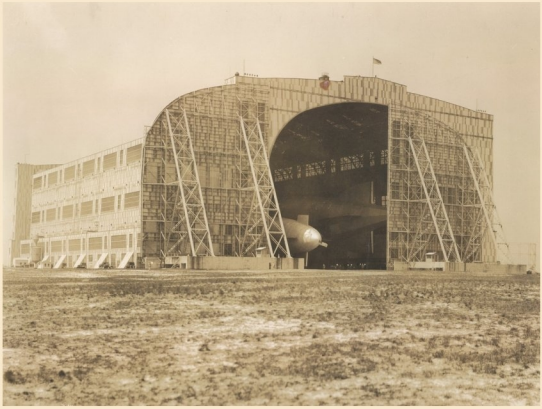
Navigation and safety features include radio communication equipment for coordination with ground stations, drift sights for estimating wind effects and course corrections, and parachutes and life preservers are provided for the crew in case of emergencies. Upon delivery to the U. S. Navy, the airship's hydrogen lifting gas was replaced with non-flammable helium in 1924 to mitigate fire risks, resulting in approximately a 10% reduction in lift capacity but a substantial improvement in overall safety. These systems contribute to the airship's performance, achieving a maximum speed of 65 knots (120 km/h), a cruising speed of 48 knots (89 km/h), and a service ceiling of 8,200 feet (2,500 m).

The ship is built with the control car built integral with the keel, without being suspended below the ship. This is for safety primarily, but also allows for less occupied space within the ship. The control car proper is at the forward end of the gondola, and mostly resembles the bridge of a seagoing ship. It is here that the ship is operated and commanded, with all operational controlling devices, including the helm, intra-ship communications, navigation, radio communications, and meteorology.

There are also stateroom accomodations within the control car gondola for senior officers and vistiting dignitaries.


U.S.NAVY

U. S. Naval Air Station
Lakehurst, N. J.



Grouped at the Naval Air Station, Lakehurst, New Jersey are all the lighter-than-air activities of the American Navy. There the Shenandoah - our first rigid airship - was assembled, tested, and was operated from. It is where the Los Angeles is now based. In addition to rigid airships, we practice with and develop the non-rigids, such as the J-1. The development of, and experiments with kite balloons are other aeronautical activities with which we are concerned. All parachutes for the U.S. Navy are tested here. Visitors are welcome, and have an opportunity to witness the latest developments in Naval Aviation.

The flying field, 1400 acres in area, is one of the largest in the world. At a cost of $6,000,000 the Station gradually developed to its present size, with huge airship hangar, mooring mast, aerological observatory (complete weather bureau) and school, helium purification plant, and shops for the overhaul of engines and aircraft repair. The Station has every modern facility for the service of all types of lighter-than-air aircraft.

To operate the airship and the plant we require approximately 50 officers, 400 enlisted men, and 300 civilian employees, with a guard of 100 Marines. In time of war, these numbers would be tripled, with a number of airplanes assigned for the protection of and cooperation with the big airships.

Helium

Fort Worth, Texas is the location of the world's first full-scale helium production plant, built by the U.S. Navy to extract helium from natural gas from the Petrolia field. This plant is crucial for the development of large, non-flammable airships like the USS Los Angeles, as it provides the necessary helium for the military's lighter-than-air aircraft program. The plant was completed in 1921 and was the early U.S. helium producer for industry before being called into military service.

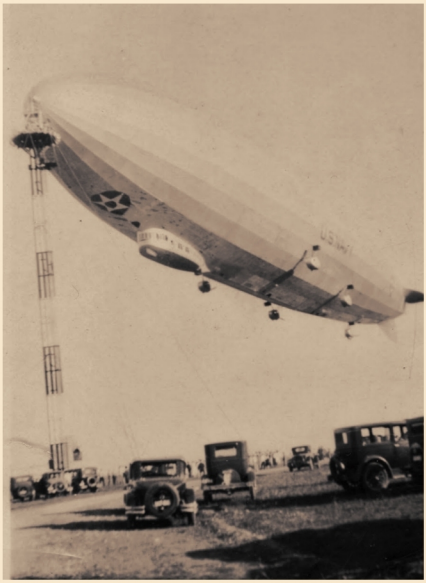
Key facts about the Fort Worth helium plant

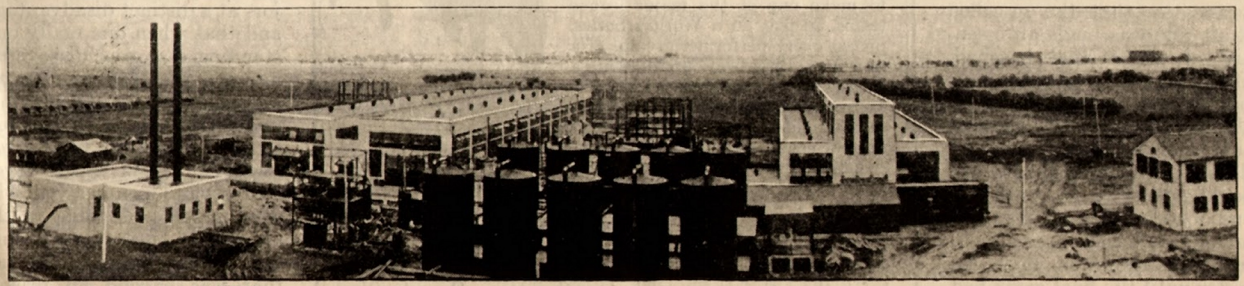
First of its kind: It is the world's first full-scale helium production plant.

Purpose: The plant is built to extract helium for military use, as it is a safer, less flammable alternative to hydrogen for airships.

Source of helium: The helium is extracted from natural gas found in the Petrolia field in Clay and Tarrant Counties, Texas.

Significance for airships: By 1923, the plant produces enough pure helium to fill the Navy's airship, the Los Angeles. The plant features a mooring mast where airships refuel with helium, oil, gasoline, and water.





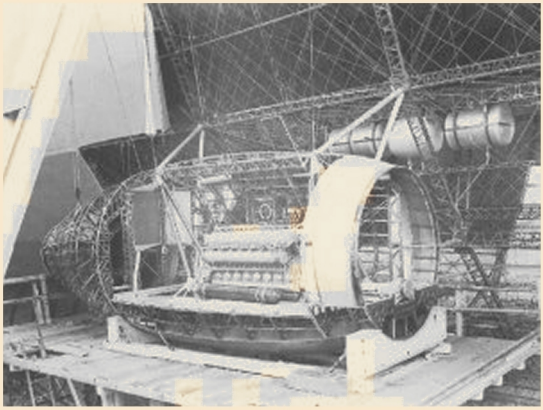
COURTESY U. S. BUREAU OF MINES

Helium Production Plant No. 1 at Fort Worth, Texas, from which the Navy now obtains helium for some of its dirigibles. This is the only establishment of its kind in the world where helium is recovered on a commercial scale from natural gas.

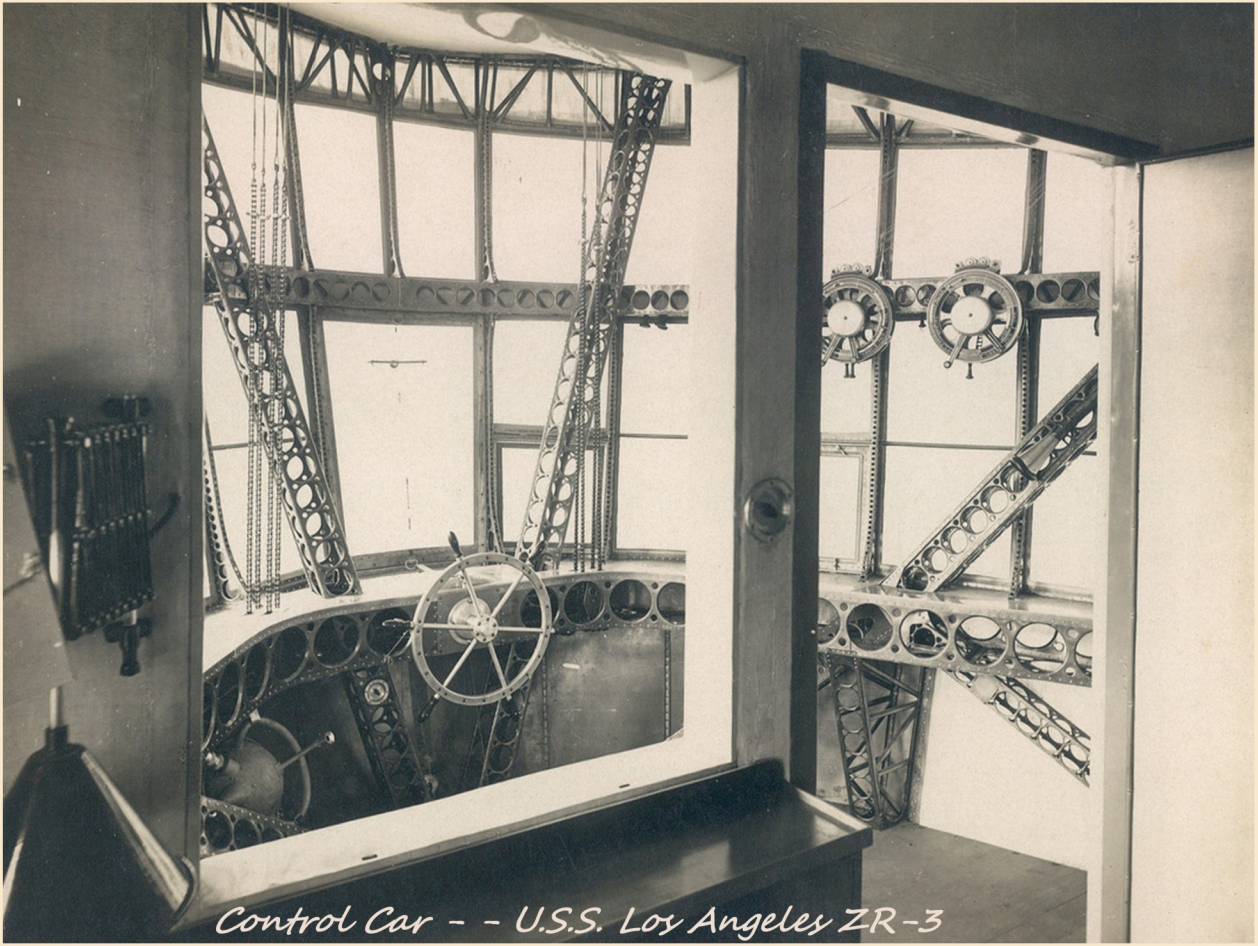
Water Recovery

The propulsion system of the USS Los Angeles (ZR-3) consists of five Maybach VL I V12 gasoline engines, each rated at 400 horsepower, mounted in separate external gondolas arranged as four wing cars and one aft on the centerline. These water-cooled engines drive two-bladed fixed-pitch wooden pusher propellers capable of running in reverse, enabling variable thrust and enhanced maneuvering without the need for swiveling mechanisms. The design emphasizes reliability for long-duration flights, with the engines drawing fuel from integrated systems to support inter-continental ranges.

Auxiliary electrical power is generated by wind-driven dynamos coupled to the propellers, supplying 110-volt direct current for onboard lighting, instrumentation, and radio operations, supplemented by batteries for emergency situations. The ballast and fuel management systems are critical for maintaining equilibrium during extended missions; water is recovered from engine exhaust gases to offset weight loss from fuel consumption, while gasoline is stored in tanks along the keel with a total capacity of 15,000 gallons. This approach allows the airship to sustain operations without frequent landings for re-ballasting.



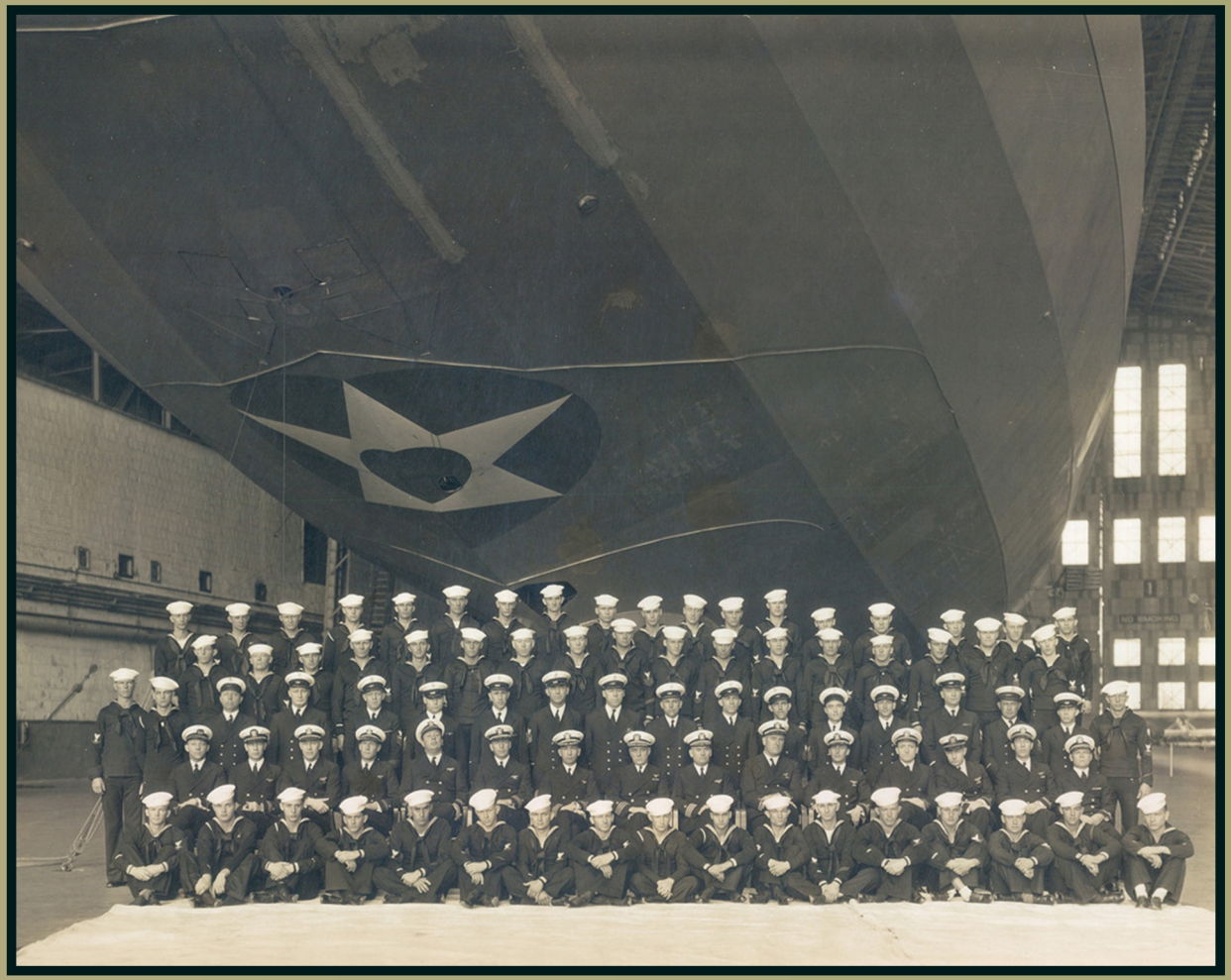
Construction view showing installation of Maybach engine with water recovery



Control Car - - U.S.S. Los Angeles ZR-3

Mooring Mast

U.S.S. Los Angeles ZR-3 Moored to U.S.S. Patoka


NO SMOKING